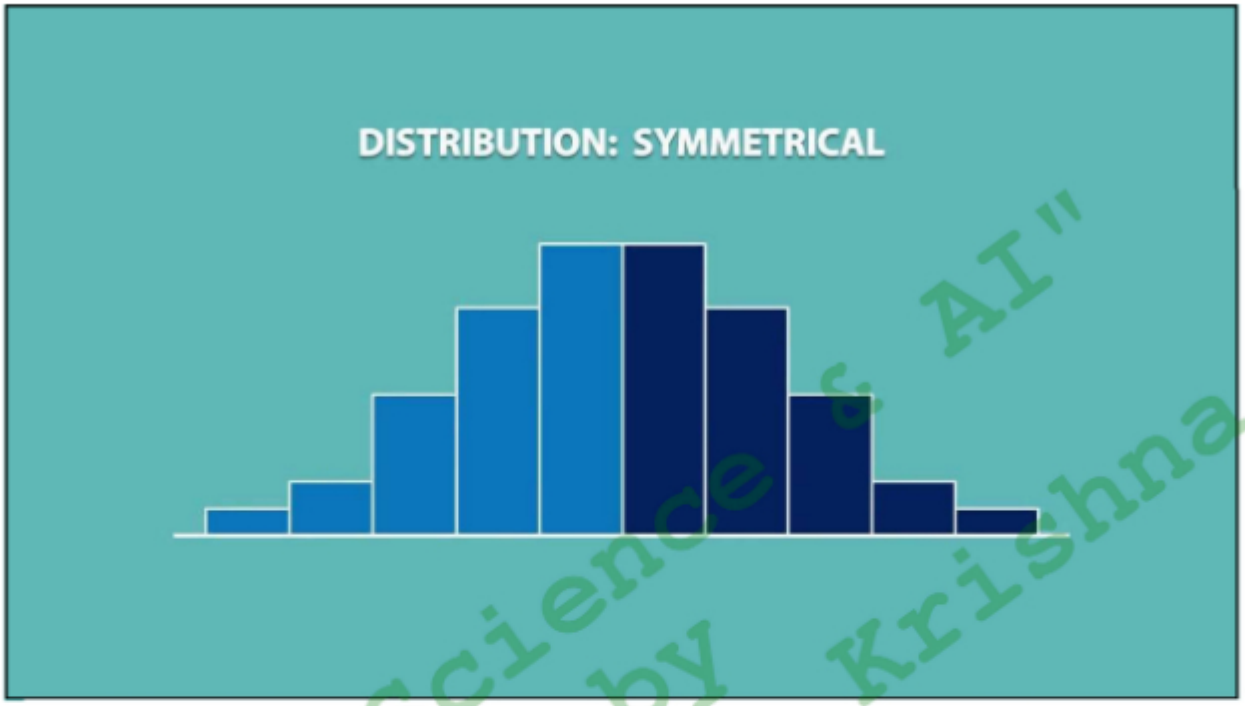
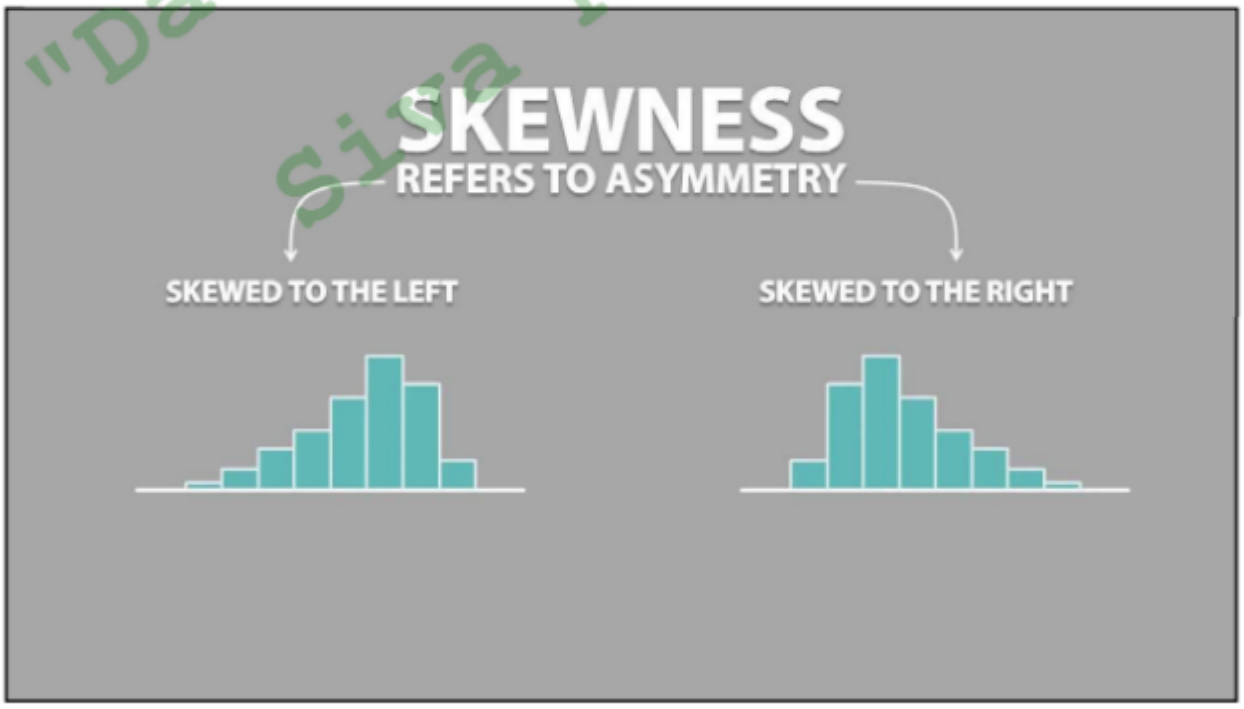
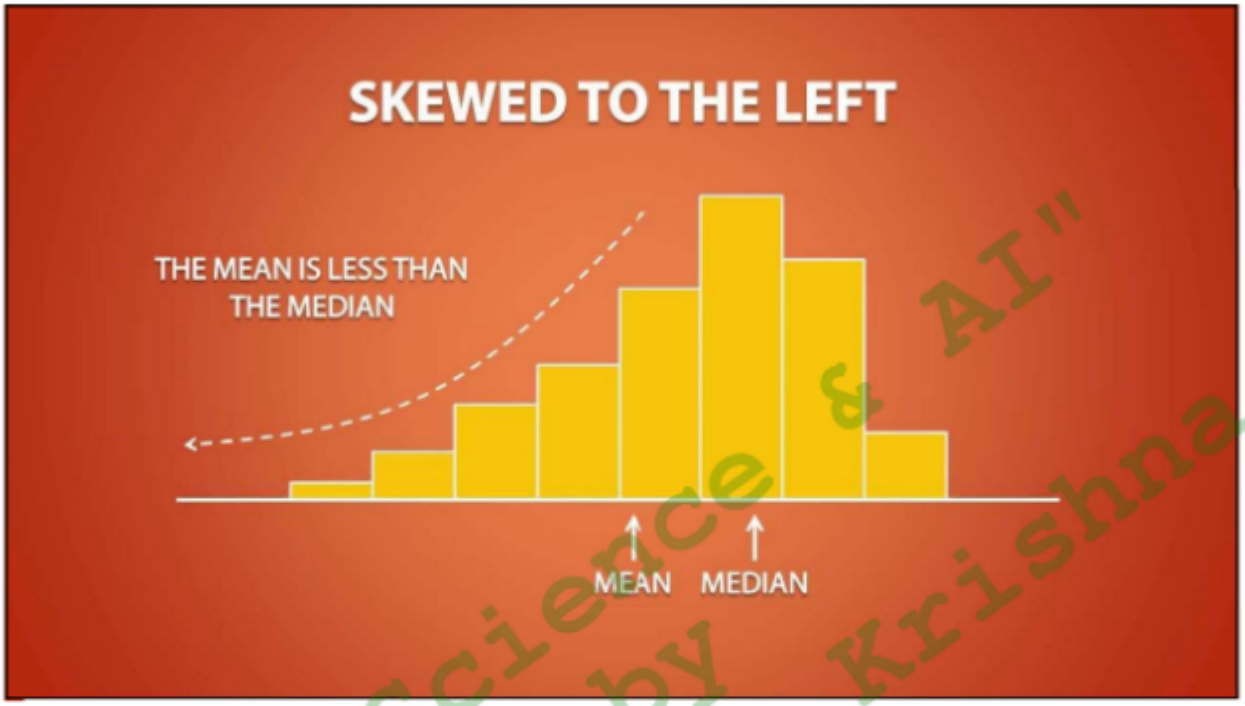
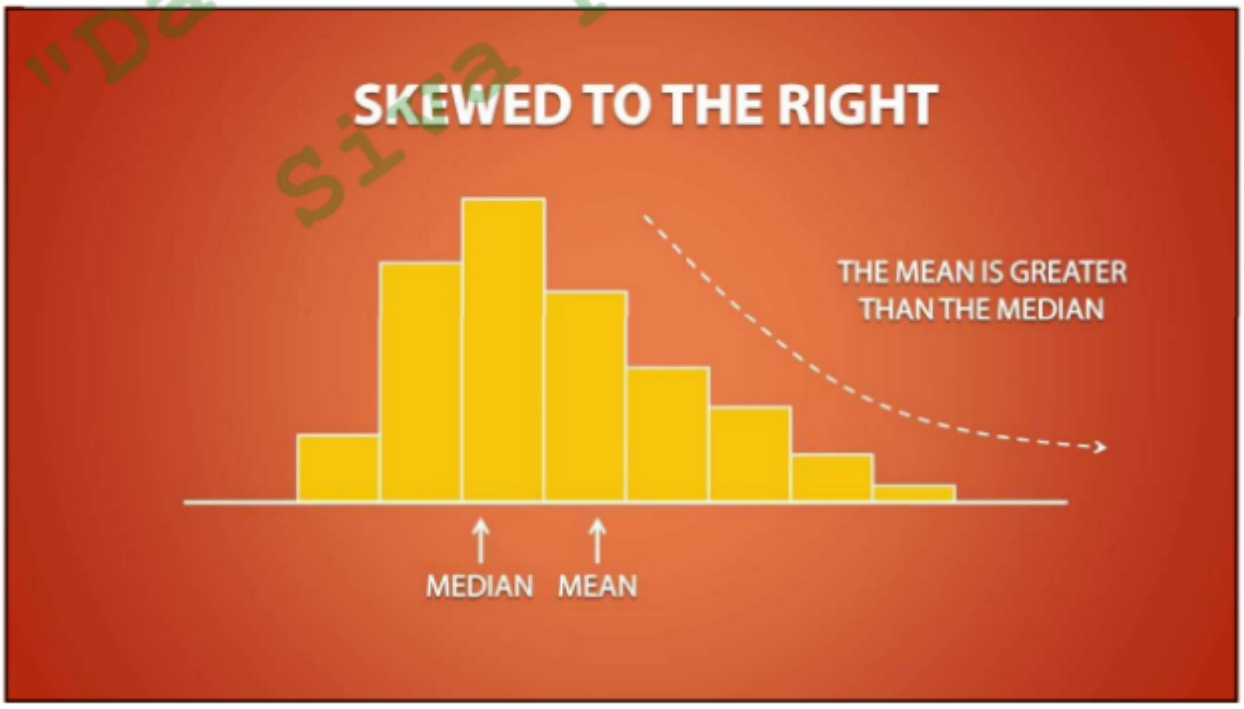
MEASURES of SHAPE

SYMMETRY AND SKEWNESS

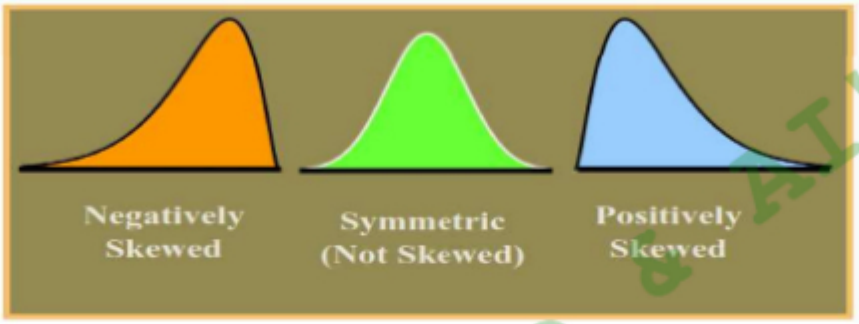






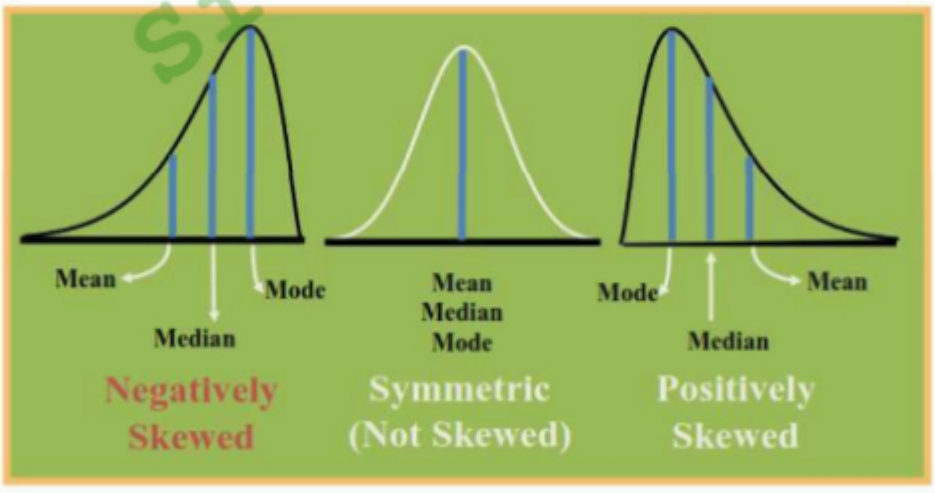


Skewness



- If S < 0, the distribution is negatively skewed (skewed to the left)
- If S = 0, the distribution is symmetric (not skewed)
- If S > 0, the distribution is positively skewed (skewed to the right)

Skewness



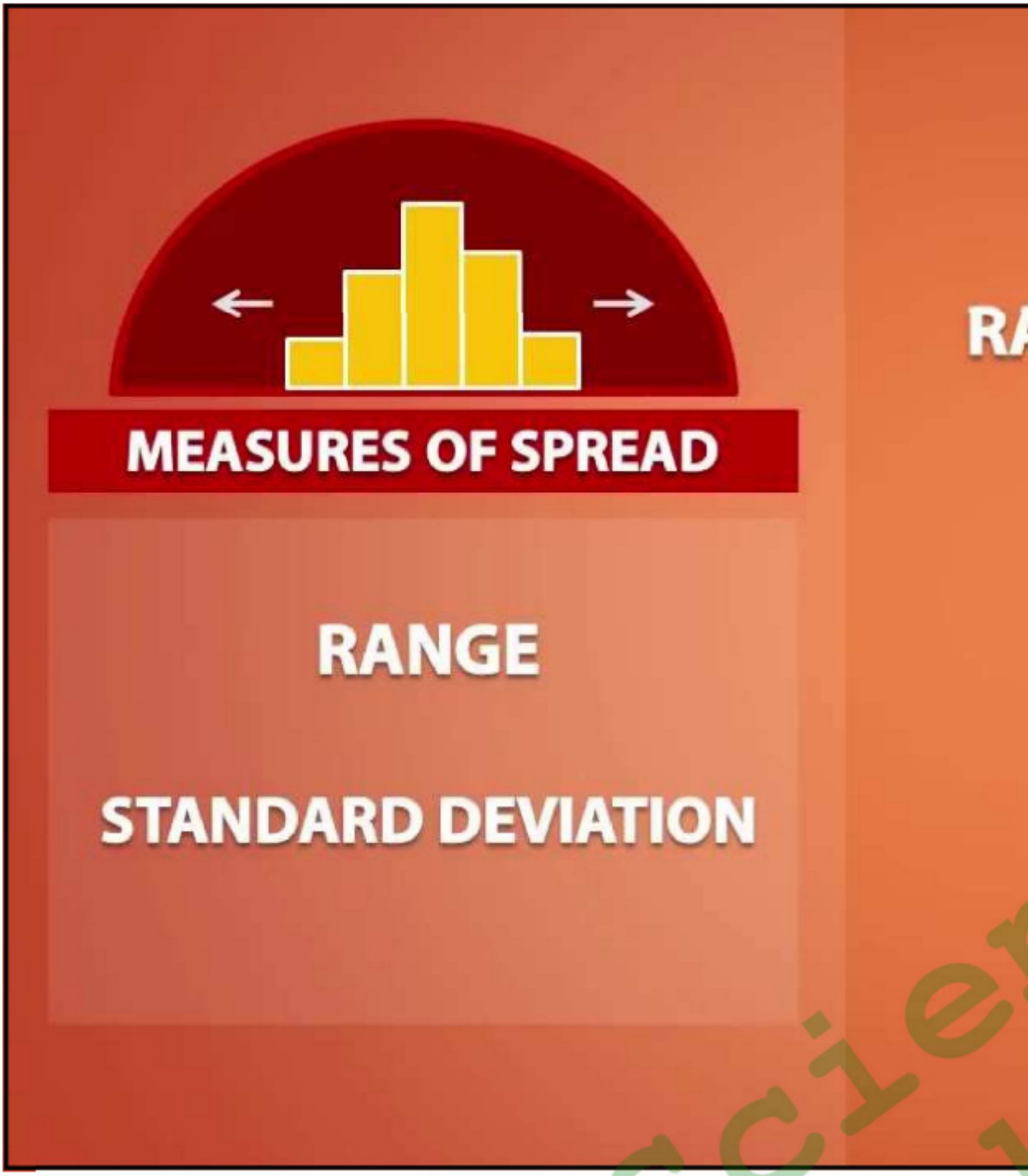
Kurtosis

- Peakedness of a distribution
  - Leptokurtic: high and thin
  - Mesokurtic: normal in shape
  - Platykurtic: flat and spread out

MEAS

C

DISPERSIO


MEASURES OF SPREAD
RANGE
STANDARD DEVIATION

Mean Abso

- Average of the absolute deviation

X	$X - \mu$	$\lvert X - \mu \rvert$
5	-8	+8
9	-4	+4
16	+3	+3
17	+4	+4
18	+5	+5
	0	24

Population Stand

- Square root of the variance

X	$X - \mu$	$(X - \mu)^2$
5	-8	64
9	-4	16
16	+3	9
17	+4	16
18	+5	25
	0	130

Sample

- Average of the squared deviations

X	$X - \overline{X}$	$(X - \overline{X}$
2,398	625	390,6
1,844	71	5,0
1,539	-234	54,7
1,311	-462	213,4
7,092	0	663,8


STANDARD
HOW CLOSE TH
ARE TO THE ME


STANDARD
HOW CLOSE TH
ARE TO THE ME
MEA
HIGH

Coefficient o

$$\mu_1 = 29$$

$$\sigma_1 = 4.6$$

$$C.V_{.1} = \frac{\sigma_1}{\mu_1}(100)$$

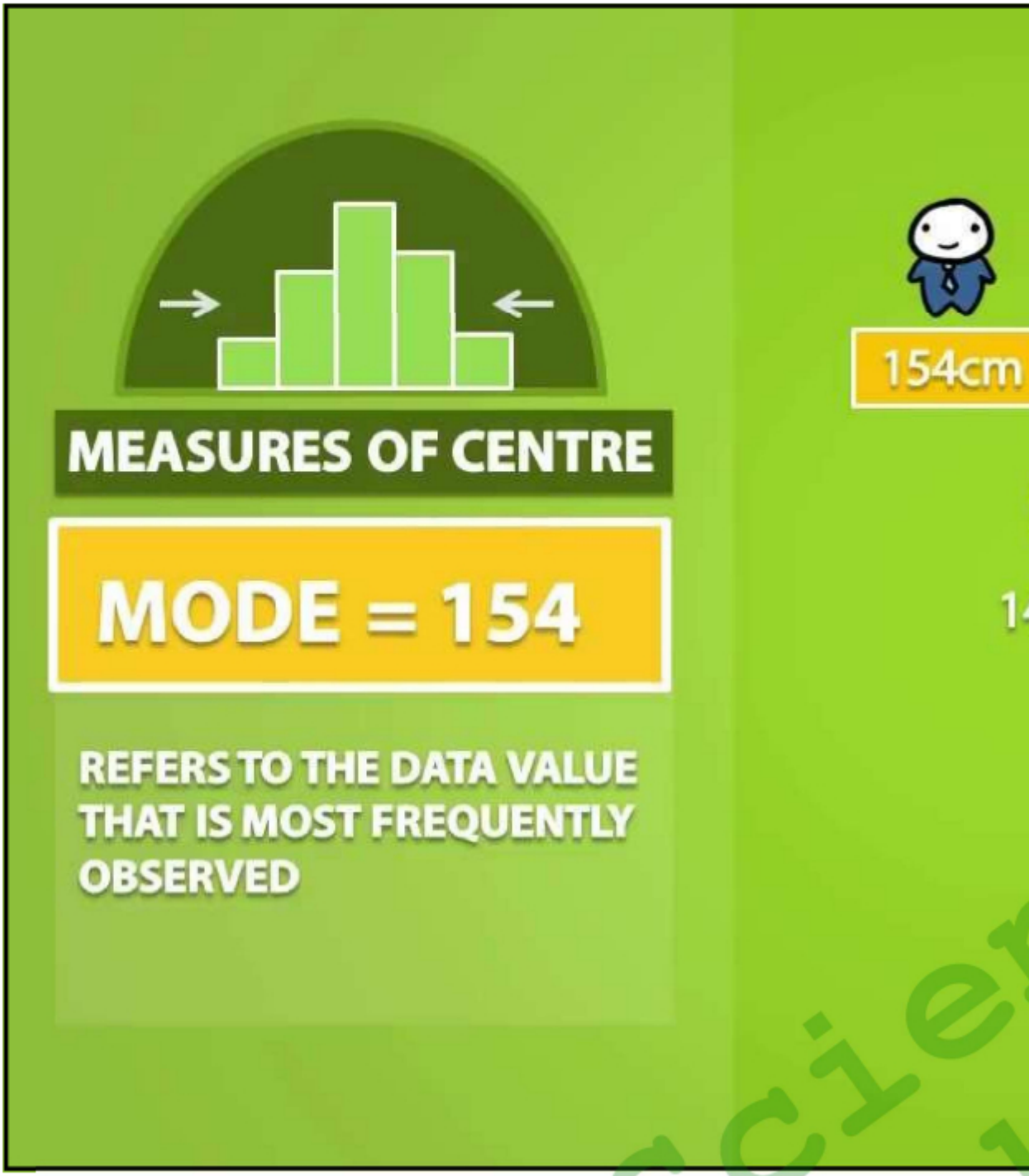
$$= \frac{4.6}{29}(100)$$

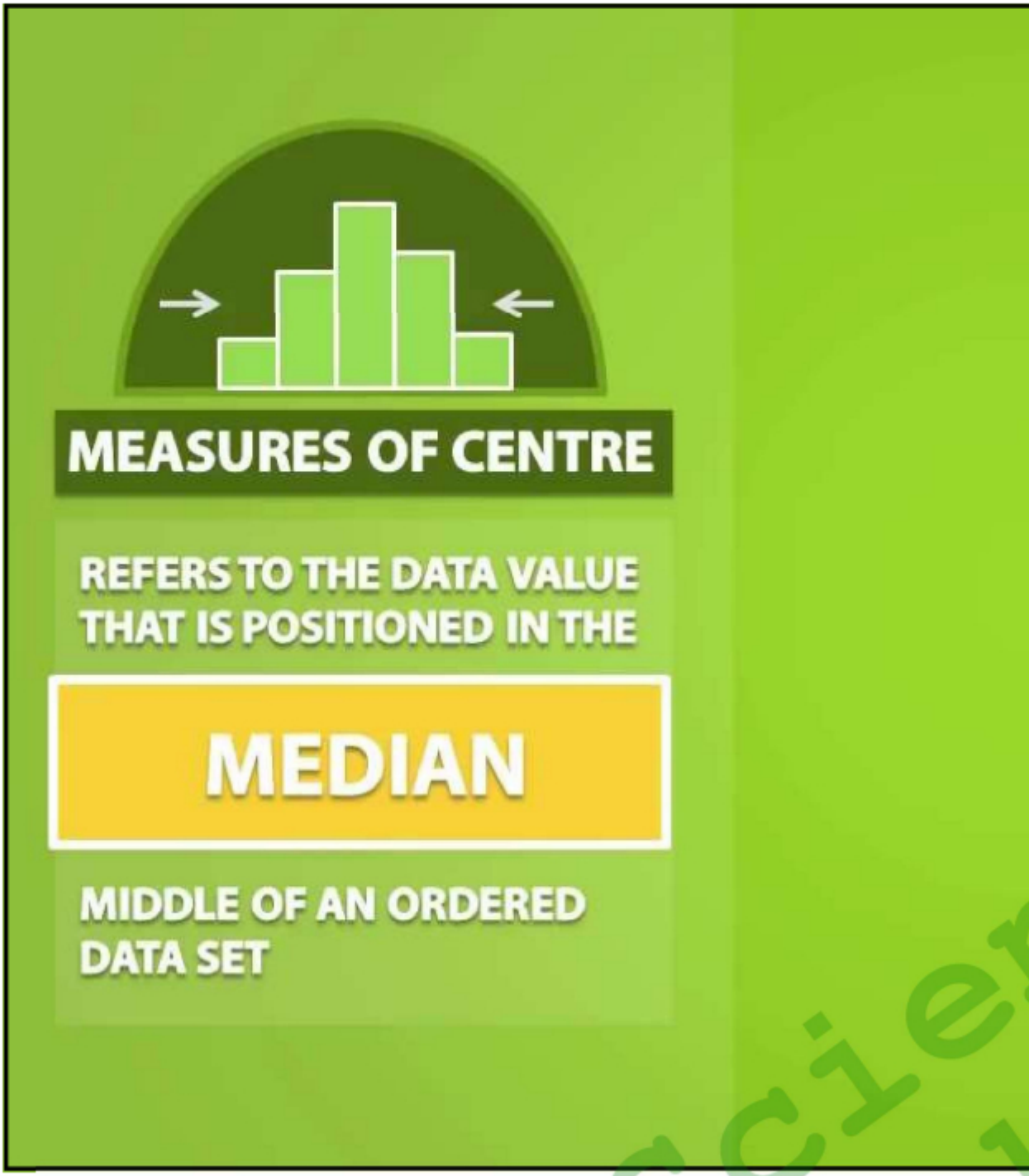
$$= 15.86$$

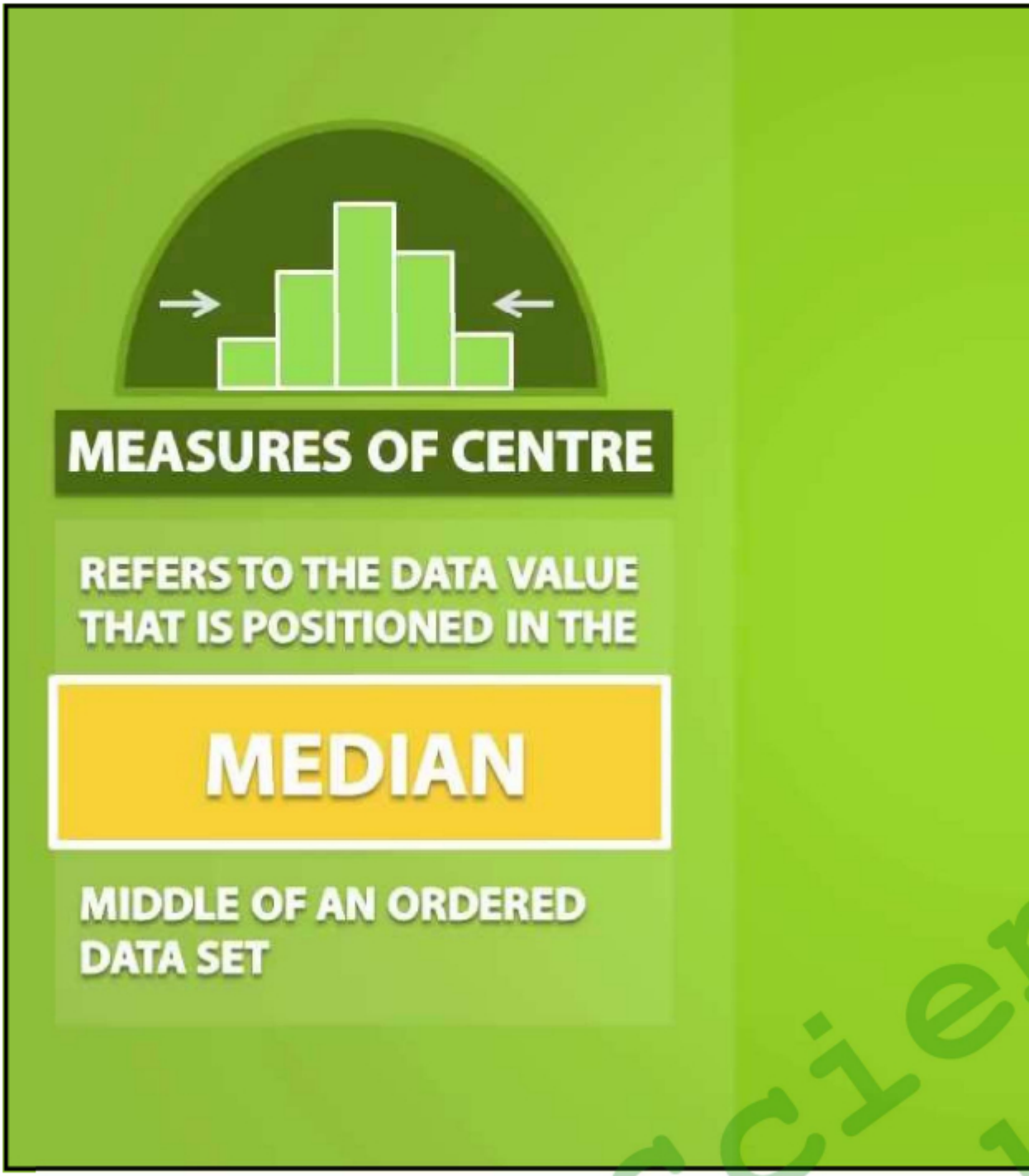
MEAS

C

CENTRAL T


MEASURES OF CENTRE
MODE = 154
REFERS TO THE DATA VALUE THAT IS MOST FREQUENTLY OBSERVED
154cm


MEASURES OF CENTRE
REFERS TO THE DATA VALUE THAT IS POSITIONED IN THE
MEDIAN
MIDDLE OF AN ORDERED DATA SET


MEASURES OF CENTRE
REFERS TO THE DATA VALUE THAT IS POSITIONED IN THE
MEDIAN
MIDDLE OF AN ORDERED DATA SET

Populatio

$$\mu = \frac{\sum X}{N} = \frac{X_1 + X_2}{}$$

$$= \frac{24 + 13 + 19 + 26 + }{5}$$

$$= \frac{93}{5}$$

$$= 18.6$$

Weighte

- Sometimes we wish to average num
  importance, or weight, to some of t
- The average you need is the ***weigh***

Weighted Av

where x is a data
the weight assign
value. The sum is
data values.

Various Samp

- **Random sampling**
  - Every unit of the population has the s sample.
  - A chance mechanism is used in the se
  - Eliminates bias in the selection proce
  - Also known as probability sampling
- **Nonrandom Sampling**
  - Every unit of the population does not included in the sample.
  - Open the selection bias
  - Not appropriate data collection meth
  - Also known as non-probability sampli

Simple Rand

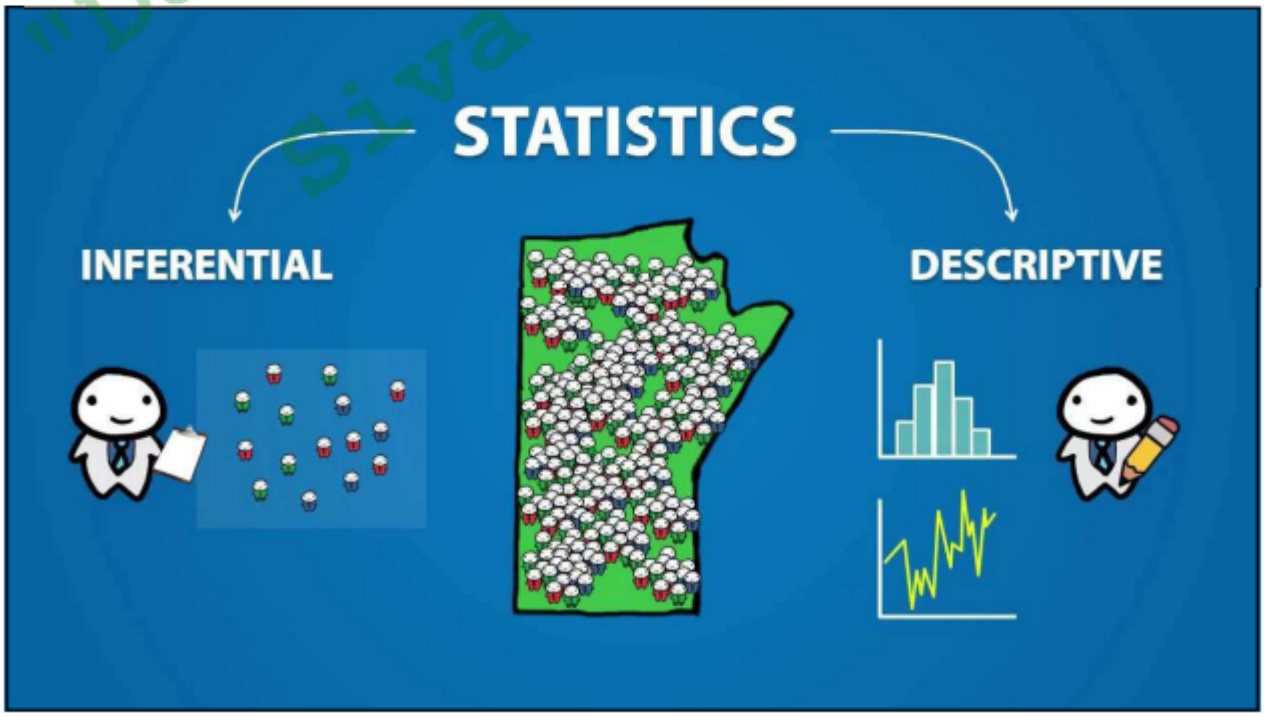
- Every object in the population has a
- Objects are selected independently
- Samples can be obtained from a tab
  random number generators
- A simple random sample is the idea
  are compared

Systematic

- Convenient and relatively easy to administer
- Population elements are an ordered sequence (at least, conceptually).
- The first sample element is selected randomly from the first *k* population elements.
- Thereafter, sample elements are sele at a constant interval, *k*, from the ordered sequence frame.

Nonrando

- **Convenience Sampling:** Sample ele
  of the researcher
- **Judgment Sampling:** Sample eleme
  researcher
- **Quota Sampling:** Sample elements
  satisfied
- **Snowball Sampling:** Survey subject
  other survey respondents



Descriptive vs Inferential Statistics

- **Descriptive statistics**
  - Collecting, presenting, and describing data
- **Inferential statistics**
  - Drawing conclusions and/or making decisions concerning a population based only on sample data

Populations and Samples

- A **Population** is the set of all items or individuals of interest
  - Examples: All likely voters in the next election
    All parts produced today
    All sales receipts for November
- A **Sample** is a subset of the population
  - Examples: 1000 voters selected at random for interview
    A few parts selected for destructive testing
    Random receipts selected for audit

Why Sample?

- Less time consuming than a census
- Less costly to administer than a census
- It is possible to obtain statistical results of a sufficiently high precision based on samples.
- Because the research process is sometimes destructive, the sample can save product
- If accessing the population is impossible; sampling is the only option